showed that the average trajectory of knee pain was relatively stable over time (increase of 0.07 WOMAC points per year). Model fit, however, was suboptimal and masked important clinical subgroups that only emerged when an optimal 5-class model was fitted to the data. Subgroups were: "Mild, but stable" (N=208, 35%), "Progressively deteriorating" (N=170, 28%), "Moderate, but stable" (N=137, 23%) "Improvers" (N=65, 11%), "Severe, but stable (N=20, 3%)". Substantial differences in patterns of health care use were observed between subgroups and subgroup membership predicted the rate of decline in locomotor function. The 5-class model was a good fit to the matched OAI data. The model gave some support for the replication of the subgroups identified in CAS-K however a subgroup representing those that were "Progressively deteriorating" did not emerge in the OAI data. This may reflect that on average, participants improved, rather than deteriorated over time in the matched OAI data (decrease of 0.25 WOMAC points per year as estimated from a 1-class linear LCG model).
Conclusions: The average view of slowly progressive knee pain is shown to be composed of distinct classes of longitudinal trajectories. Correctly identifying class membership at baseline could support targeted intervention, monitoring, and confident reassurance. Differences between cohorts in the rate of improvement and progression of pain deserve further exploration.

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LONG-TERM EFFECTS OF VIDEO-BASED HOME EXERCISE ON CLINICAL AND RADIOGRAPHIC OUTCOMES IN SUBJECT WITH KNEE OSTEOARTHRITIS: A TWO-YEAR RANDOMIZED CONTROLLED TRIAL

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Purpose: It is well known that physical exercise has beneficial effects on pain and physical function of the population with osteoarthritis (OA) of the knee. However, its positive post-treatment effects on pain and physical function decline over time. Exercise adherence has been shown to be an important predictor of long-term outcome in exercise therapy. Video media can be an effective means of delivering exercise instruction. Therefore, use of a home exercise video could enhance adherence to prescribed exercise program. Then we have hypothesized that video-based home exercise could enhance long-term adherence to prescribed exercise program and produce long-term improvements in pain, physical function and quality of life in patients with knee OA and also prevent radiographic progression of knee OA. The purpose of the present study was to test this hypothesis by a two-year randomized controlled trial.
Methods: A total of 107 subjects with radiographic evidence of OA were randomized to a video-based exercise group or a control group. Entry criteria were defined as knee pain, age over 50 years old, and radiographic evidence of OA (Kellgren-Lawrence Grade 2, 3, or 4). Subjects in the video-based exercise group received a exercise video and used it during home exercise. Subjects in the control group initially received detailed instruction of a quadriceps exercise. Subjects in both groups were evaluated after 3, 6, 12, and 24 months and compared with the baseline scores. Measured outcomes were self-reported exercise adherence collected from diaries, the WOMAC, SF-8, the BMI and radiographic OA parameters (i.e. medial minimum joint space width, medial joint space area, medial osteophyte area, and femorotibial angle (FTA)) using the knee osteoarthritis computer-aided diagnosis (KOA-CAD) measuring system.
Results: The subjects in the video-based exercise group performed the prescribed exercise 5.4 and 5.1 times a week at 3 and 6 months, while those in the control group performed the prescribed exercise 4.3 and 3.9 times, respectively. However, the numbers of exercise times in the video-based exercise group significantly decreased from the 3-month period to 12- and 24-month periods and there was no significant difference in self-reported exercise adherence between two groups at 12 or 24 months. The improvements in all categories of WOMAC were significantly greater in the video-based exercise group than in the control group at all time periods and the improvement in SF-8 physical component summary was significantly greater in the video-based exercise group than in the control group at 3, 6 and 12 months. There were no significant differences in the SF-8 mental component summary or BMI between two groups. Regarding radiographic OA progression of the knee, the video-based exercise group showed significant increase in FTA at 12 and 24 months compared with the baseline values, while we could not find significant progression in any radiographic parameters of the control group. There were no significant differences in the changes of any radiographic parameters between two groups.
Conclusions: The present two-year randomized controlled trial showed that video-based home exercise does not sustain adherence to prescribed exercise program for more than 12 months in spite of long-term improvements in pain, physical function and quality of life in patients with knee OA. In addition, this video-based home exercise cannot prevent long-term radiographic progression of the knee OA.

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EFFICACY OF TOPICAL NONSTEROIDAL ANTI-INFLAMMATORY DRUG (NSAIDS) ADHESIVE SKIN PATCH IN QUADRICEPS MUSCLE EXERCISE FOR KNEE OSTEOARTHRITIS - A RANDOMIZED CONTROLLED TRIAL

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Purpose: Knee osteoarthritis is multifactorial common disease and many conservative treatments are existed. Among them, quadriceps muscle strength exercise and topical NSAIDs adhesive skin patch are most popular methods in clinical field in Japan. The objective of this study is to evaluate the effect of topical NSAIDs adhesive skin patch in quadriceps muscle strength exercise.
Methods: Fifty-seven cases (114 knees) with bilateral medial knee osteoarthritis (KOA) were evaluated. They were all female and average age was 67.1 years. Two comparative groups, quadriceps muscle strength exercise only (Q-group) and combined quadriceps exercise and topical NSAIDs (loxoprophen) adhesive skin patch (Q+C-group), were randomly allocated. Same home-based exercise treatment protocol was performed in both groups for 8 weeks, and change of quadriceps muscle strength and knee pain were evaluated as early primary outcome. Home-based quadriceps exercise and muscle strength evaluation was performed with our developed quadriceps muscle training machine and visual analogue scale (VAS) was used for evaluation of knee pain.
Results: There were no significant differences between Q-group (56 knees) and Q+C-group (58 knees) in age, body height, body weight, and BMI. After 8 weeks exercise protocol, significant increase of quadriceps muscle strength was seen in Q+C-group. In Q-group, quadriceps strength was also increased but its change was not significant. VAS of knee pain after 8 weeks protocol was significantly decreased in Q+C-group compared with that of before treatment. There were no between-group differences in both before and after exercise protocol
Conclusions: The combined use of 8 weeks quadriceps muscle strength exercise and topical NSAIDs adhesive skin patch may have advantage for early increase of muscle strength. This result will be caused mainly by the pain relief effect with topical NSAIDs adhesive skin patch.

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DEXAMETHASONE CAN RESCUE CYTOKINE-INDUCED CHONDROCYTE APOPTOSIS IN BOVINE AND HUMAN CARTILAGE

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Purpose: In vitro studies have shown that cytokines such as interleukin-1 (IL-1) and tumor necrosis factor-α (TNF-α) can induce significant chondrocyte apoptosis. Furthermore, the concentrations of these cytokines are significantly elevated in the synovial fluid of patients immediately after traumatic joint injury and post traumatic OA progression. Therefore, the ability to inhibit cytokine-induced chondrocyte apoptosis has become an essential criterion in the development of a potential therapeutic for PTOA. Here, we investigated in vitro the anti-apoptotic effect of the anti-inflammatory glucocorticoid Dexamethasone (Dex), using young bovine and adult human.
Methods: Bovine cartilage disks (3 mm x 1 mm, with superficial zone) were harvested from 1-2 week-old calves. Human cartilage disks (3 mm x 1 mm) were obtained postmortem from the knee joint (Collins grade 0) of a 19-year-old male and the ankle joint (Collins grade 1) of a 64-year-old female donor. All procedures were approved by both Rush University and MIT. Concentrations used were: IL-1α (1 ng/ml), Dex